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CARNIVOROUS PLANT NEWSLETTER

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CARNIVOROUS PLANT NEWSLETTER

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Plant Society



Volume 20, Number 3
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Front cover: A large *D. graminifolia* plant on sphagnum next to a bromeliad. See article beginning on page 80.

Rear cover: Flowers of *U. "purple flower"* growing in sphagnum at around 1900m.

The co-editors of CPN would like everyone to pay particular attention to the following policies regarding your dues to the ICPS.

All Correspondence regarding dues, address changes and missing issues should be sent to ICPS c/o Fullerton Arboretum, CSUF, Fullerton, CA 92634. DO NOT SEND TO THE CO-EDITORS. Checks for subscription and reprints should be made payable to ICPS.

All material for publication, comments and general correspondence about your plants, field trips or special noteworthy events relating to CP should be directed to one of the co-editors. We are interested in all news related to carnivorous plants and rely on the membership to supply us with this information so that we can share it with others.

Views expressed in this publication are those of the authors, not necessarily the editorial staff.

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Editor's Corner

A Word About CPN Production

By

Leo Song, Jr.

Acting Business Manager

You may have noticed a slightly different look to CPN during the past year. We have entered the era of desk top publishing. Using Aldus Pagemaker 4.0 on the Macintosh has rendered hand paste ups obsolete and corrections quite simple. With this in mind, the editors are requesting that articles longer than one CPN page in length be submitted in one of the following formats.

1. 3.5 inch disk using Microsoft Word 4.0 or equivalent, using a Mac so that disk conversion would not be necessary and the desktop editor can import the file directly into Pagemaker. This will minimize typos-they would be your own. A laser printed hard copy should accompany the disk in case the disk is not readable and the document must be scanned. In any case, the hard copy will be used for editorial purposes. Use at least 12 point type (the type size in CPN is 9 point). Graphic materials (slides, prints, drawings) can be sent as before.

2. 3.5 inch disk from an IBM PC or clone. Include name of word processor (preferably Microsoft Word 4.0) and version. Hard copy should also accompany disk per above requirements.

3. Laser printed hard copy 10 point type or larger. This will be scanned and put into a Microsoft Word file using OmniPage 2.0 or higher.

4. Dot matrix 10 point or larger using a new ribbon. This will also have to be scanned. All dots should be clearly visible-we have had trouble with copies where the descenders are much lighter than the body of the letter-"y" scans out as a "v" for example. Please use regular white bond paper and print on one side only.

Documents that have to be scanned are subject to error. Usually a clear laser printed copy will be scanned with 100% accuracy, but special characters may be a problem. One of the co-editors (Leo) will have to do this and make sure the copy going to the desktop editor is clear of all scan errors. This of course will take more time. Options one and two are preferred and less subject to error.

At the present time, we are not set up to scan slides or prints, but hopefully soon we would be able to do this. All color still goes through a four part printing process. The time is coming where CPN may be available as a disk complete with color!

Want Ads

Gordon Snelling (300 Carter; Glendora CA 91740; USA)

S. N. fusca, N. alata, N. tobaica, N. reinwardtiana, & various highland *Nepenthes*.
Wait for current update.

Charles L. Powell, II (2932 Sunburst Dr., San Jose, CA 95111)

FOR SALE: Durastill. A small used electric still with 5-gal reservoir (In excellent condition). \$800 new, asking \$250 plus shipping. Produces about 10-gal. a day.

News and Views

Kevin T. Akins (1686 Jupiter Ave., Hilliard OH 43026) sent us the following on his success with producing and germinating seed of *Heliophora* spp.:

"I have had success in producing 65 healthy seedlings of *H. heterodoxa* and ten of *H. nutans*. The first flower I had on *H. heterodoxa* produced 65 seeds. The first day it opened, I removed one stamen and cut the anther in half with a razor blade. I squeezed the halves with a forceps and a white, damp pollen came out. At this point, I pressed the opened anther with the pollen adherent to it against the stigma of the same flower. I repeated this procedure daily for the next five days with different anthers from the flower. Within three weeks the ovary swelled. I cannot recall how long it took the ovary to dry and turn brown (roughly three months), but when it was totally brown, I split it open and recovered the 65 seeds.

"I believe the most important aspect is if the pollen is ripe in the anther. In most cases a clear liquid is squeezed out of the sectioned anther. If this happens, pollination and fertilization cannot occur and the stigma turns brown and non-receptive within a day. You must try each day until you get the sticky, whitish pollen.

"After collecting the seeds, I planted them immediately. The soil mixture I used was 1 part sand, 1 part perlite, and 1 part milled sphagnum. I cut up live sphagnum into very small fragments and covered the surface of the soil with it. The seeds were planted on the surface of the sphagnum, the sphagnum preventing the overgrowth of algae. Within two weeks, every seed had a green root coming out.

"I was surprised with the high percentage of seeds that sprouted, nearly 100%. I am keeping them at about 70° F. average temperature. I recently replanted four seedlings experimentally into a bark mix, and these developed good root systems. I believe the initial medium was a good one for germination. The potted seedlings must be kept barely moist and occasionally misted with water. If they become too wet or the medium is not open enough, they may not put out good roots.

"I have recently produced *H. nutans* seedlings. The first time after pollination, the ovary did not swell up so I thought that fertilization had not occurred. However, I broke it open and there were six seeds. It is advisable to allow the ovary to always turn brown before opening, whether it has swelled or not."

Keith Allen (715 South 21st Street, Harrisburg, PA 17104-2402) writes:

In a previous issue of CPN (Vol. 18, No. 3) I commented on the harvesting of *S. leucophylla* for the florist trade. Shortly thereafter, I received a brochure published by the Natural Resources Defense Council pointing out the extent of this problem and asking for a boycott of the practice. The contact person listed on the brochure is, Dr. Faith T. Campbell, Natural Resources Defense Council, 1350 New York Avenue, N.W., Washington, DC 20005.

Ironically, the artificial flower industry has now gotten into the act. While visiting a local florist supply, I spotted some stalks of *S. leucophylla* poking out of the artificial arrangements. (The "S." in this case must stand for "silk"! — see photograph next page.)

In an attempt to "improve" on the real thing, the manufacturer placed a pink worm-like appendage protruding from the mouth of the pitcher. Most people think that the pitchers are flowers anyway, so, I guess, this addition was supposed to be the pistil, possibly a spadix (or maybe an unlucky earthworm that became petrified during digestion.)

Curiously, the artificial *S. leucophylla* was labeled "Cobra Lily" by the manufacturer. Searching further, I spotted some stalks of silk *D. californica*, only this time the



plant was labeled "Parrot Lily." Its grey and black color further attested to its "authenticity." I suppose in Thailand, where the "flowers" were manufactured, it's difficult to find the real thing for comparison.

As silly and inaccurate as these fake plants appear, we should probably be glad that they are available. It might discourage somebody who would otherwise have scavenged the real thing for a centerpiece.

Silk *S. leucophylla* pitchers.

Thomas Alt (Waldstr. 12; 6610 Lebach-Aschbach; Germany)

Upon my return from a holiday in Australia, I was disappointed to find that during my absence I lost some highland species of *Nepenthes*. For this reason, I began to grow *Nepenthes* species *in vitro* to have a safe reserve of each species. I

learned a method to sow sterile *Nepenthes* seeds in culture and to grow and multiply them. Its interesting that plant material grows *in vitro* much better than normal sowings.

At this time, I have species as *N. ventricosa*, *N. bongso*, *N. pervillei*, *N. carunculata*, *N. lowii*, *N. bongso x inermis*, *N. ventricosa x inermis* and others. Now I am searching for fresh *Nepenthes* seeds to get as many species as possible *in vitro*.

The seeds of thin, fine *Nepenthes* are somewhat difficult to sterilize without destroying them, but the use of fresh seed is quite good. This method turned out to be so good that I began to grow also *Sarracenias* and *Darlingtonia* *in vitro*.

The sterilization of *Sarracenia* seeds is much easier because the outside seed cover is so hard. This genus germinates even easier *in vitro* because the sodium hypochlorite seems to soften the seed surface. For this purpose, I need 50-60 seeds of *Nepenthes* to assure a good germination number. To grow a species by this method is a lot of work and therefore it is very important that I have pure and verified species seed.

People who send me seed can get plant material provided there is successful germination. I already have nearly all the species and forms of *Sarracenia* but can use more *Nepenthes* species. In addition, I have *Darlingtonia* and *Heliamphora heterodoxa* and *H. minor* in culture at this writing. Some other species are in preparation and when officially announced these plants will be available with no problems due to CITES rules for exporting them to other countries.

I have *Nepenthes edwardsiana*, *carunculata*, *rajah*, *lowii*, *pervillei*, *madagascariensis*, *ventricosa*, *bongso*, *bongso x inermis*, *ventricosa x inermis* and others.

Terry Brokenbro (14 Hood Road, Rainham, Essex, RM13 8AS, Great Britain) writes:

For some time, I have been studying the *Drosera binata* complex and I am searching for a specimen of *Drosera x dinata*. This hybrid was made by Bob Hanrahan and offered for sale in WIP in 1977. It was a cross between *D. binata* and *D. binata*

dichotoma. It appears to produce an extra long and floppy T-leaf configuration. On odd occasions a new shoot will divide on one side of the "T" but not the other. If anyone is still growing this hybrid, please contact me.

Peter D'Amato (P.O. Box 1372; Guerneville CA 95446)

Enclosed is a photo of a mucilage-like substance produced on the flowering scapes of *Utricularia subulata*. I have not seen this mentioned in the general literature to my recollection. The droplets are quite viscid, and no doubt inhibit crawling insects from attacking the flowers. Numerous dead gnats and ants were observed caught in the fluid, which, when touched with forceps, threads away without breaking for up to 24



Utricularia subulata scape mucilage.

inches! Has anyone observed this defensive act on other bladderwort flower spikes? The evolutionary implications, in relationship to their cousins *Pinguicula*, are curious. I wonder if the glue has any digestive capabilities.

Another interesting phenomenon occurred on a neglected *Drosophyllum* plant I had a couple of years ago. Some of the plant's leaves were submerged in an adjacent water tray for a period of months. Several roots, over 12 inches in length, had sprouted from

the glandular leaves! I removed the leaves and roots and potted them up, but no plants were produced. However, experiments may lead to a new way of propagating this plant, perhaps through some form of soil-layering.

Robert Gassin (43 Frudal Cres., Knoxfield 3180 Australia)

As you may recall, I forwarded an article requesting plant donations for a new Botanic Garden in Cranbourne Victoria. This was published in CPN vol 19, No.3. Since then, there has been a few developments which I would like to share with CPN readers. On the negative side, because of economic constraints, development of a large section of the garden has been delayed. Unfortunately, this delay affects the CP area as it means construction of the board crossing over the area has been put on hold. Furthermore, due to the financial situation, the section of the garden containing the CP area will remain closed to the public for two years. However, all is not gloom and doom, because of the enthusiasm of the Victorian Carnivorous Plant Society for the project, The Botanic Garden is still accepting donations. These, upon receipt by the Garden, are planted straight into the ground. The first planting of CPs took place in early May of 1991. The following species are now growing in the CP area: *Cephalotus*, *Drosera binata* var *dichotoma*, *D. callistos*, *D. dichrosepala*, *D. enodes*, *D. glanduligera*, *D. hamiltonii*, *D. nitidula* ssp *omissa* x *occidentalis* ssp *occidentalis*, *D. ocephodian*, *D. pygmaea*, *D. roseana*, *D. spathulata*, *U. biloba*, *U. dichotoma*, *U. dichotoma* aff *Kalbarri*, *U. lateriflora*. Further plantings will take place throughout the coming months. More donations are required to make this unique project a success.

Tom Kahl (1351 Lake Washington Blvd. S., Seattle, WA 98144) reports on the freeze of last winter and its effects on his plants:

"This last year's freeze in 1990 was hard on a lot of my CP, as have been previous cold spells in preceding years. I would like to report what will survive up here at a cold 11° F.

"I have these *sarracenias* growing in large 24 to 30 inch tubs: *S. purpurea*, *S. flava*, the hybrids between these last two, and *S. oreophylla*. Along with the pitcher plants there are *Drosera rotundifolia*, *D. anglica*, , and resprouting now from the roots, *D. capensis*. All survived .

"Our climate here is mostly cloudy and rainy from October through March, and if we are lucky sunny for the rest of the year, although reality is five out of seven days in a week are cloudy. The cool climate is ideal for highland *Nepenthes* which are more durable than you might think.

"I grow my *Nepenthes* in an attached greenhouse which never got below 38° F. at the peak of the winter freeze. Our water quality here averages 62 ppm and tap water seems to have no ill effect on the plants, but I periodically leach the soil out just in case. Our photoperiod here does have an effect on pitcher development. The short eight hour days of winter make it hard for any growth, but growth will resume in the spring and summer with no ill effect from the short days.

"I have been experimenting with uncommon soil mixes for growing *Nepenthes*. Coconut sawdust, P-4, cotton and husky fiber are a few I have tried. All of these will sustain *Nepenthes* but growth is slow compared to a bark/perlite/sphagnum mix. I do have *Nepenthes* seedlings sprouted in coconut sawdust and cotton, and *Byblis liniflora* in rockwool. I have been trying these mixes because of the unavailability of the bark/perlite/sphagnum in Cebu, Philippines, where I have ongoing research on *Nepenthes* via Bonifacio VY.

"Because Seattle is on the west coast, our humidity drops in the summer and my greenhouse humidity will easily be at 40%, but this has no effect on pitcher size or quantity compared to the effects of short photoperiods in the winter."

Gregory Lum (510 Lansdale Ave.; San Francisco CA 94127 USA) writes: I am 18 years old and I became a member of the ICPS in November, 1990. I have a collection of over 100 CP's which I have grown since the age of 15. I grow most of them outside in a coll-growing greenhouse and the rest of them inside in a tall aquarium. I also collected and grow dozens and dozens of orchids and bromeliads. I would like to get to know more people who are growing CP.

The purpose of this letter is to voice one of my concerns about the Society. Every year here in San Francisco, there is one big flower show. There are many categories, one of them being the CP Division.

I was a host at this year's past show. In the CP Division, many people asked me various questions about the care and culture of the plants. During the course of the show, some people also asked why there are not more CP shows going on.

I have heard that the general public has many misunderstandings about CP's. Some people wonder whether they eat off your hand finger? Patrons of the show said that many people are very interested in seeing more CP, not just a regular three inch *Dionaea*, but a 8-inch pot of *Dionaea* and a *Cephalotus*.

There should be more shows, exhibits and contests all over. I encourage all people to take steps in promoting this.

I am also interested in field trips to see CP growing wild in nature.

Joe Mazrimas reports:

The San Francisco Garden show held from August 23-25,1991 displayed the largest number of CP (75) than ever before. As in the past, Geoffrey Wong stole the show winning Best in Show award for his splendid plant of *Genlisea repens* which was displayed in a small plastic container. The spiral roots can be clearly seen projecting into the water basin. He also took the best Australian plant award for the *Cephalotus* plant. Participants in this show were: Allan Ber, Kyle Williams, Virginia Wong, Carl Wong, Larry Logoteta, Sherry Logoteta, Geoffrey Wong, Kathy Mazrimas, Joe

Mazrimas, Glen Lum, Loretta Lum, Gregory Lum and Mike Morris. We like to thank Tony Rea and Allan Ber for setting up the displays which drew large crowds of viewers who marveled at these remarkable plants.

B. & M. Pierson (P.O. Box 179; Albion Park; NSW 2527; Australia) writes: This year, in this part of Australia we had a milder than normal winter, despite several cold snaps. Normally our winter here is moderately cold, with quite strong south westerly winds in August, occasionally September, and occasionally in July also.

Normally, I notice new growth on my *sarracenias* and cut them back about the middle of August. This year, however, new growth and flowers became evident in early July, presumably because of the mild spring like weather that we experienced at this time of year.

This necessitated cutting back the plants in mid July, instead of August. I normally remove all the old pitchers from all plants except *S. purpurea*, cutting them right back to the rhizome. This leaves the way clear for emerging flowers and pitchers. The cutting back is done as soon as new growth and flower buds are seen on several plants.

I have also noticed very early growth on my *D. binata* plants, and also some hibernaculum forming *Droseras* are starting early growth, although many are still dormant.

Watering Against the Books

Normally it is recommended that *sarracenias* and other plants that go dormant during the winter should be kept a little drier than normal, with no water in the trays, and the potting mix being kept moist only. It has also been recommended to dry out the potting mix of some hibernaculum forming *Droseras*.

In my early days of growing CPs, I followed this advice, and had some losses each year. After a few years, I decided to leave the trays full of water over the winter, and observe the outcome. I found that I lost far fewer plants by keeping the plants wet. This may be because of our climate here, as the temperature in the daytime in winter is normally 50°F to 60°F, and at night between 34°F and 45°F. About the only plants that I do keep a little drier in the winter is *Nepenthes*, particularly my lowland plants, as they are only heated to a minimum of 55°F at night, and daytime temperatures may reach 70°F on a warm day in the polyhouse in which I keep them. The highland *Nepenthes* are housed in a 50% shadehouse, and are subject to outside temperatures and rainfall.

Propagating tuberous *Drosera*

This year I have been experimenting with the propagation of tuberous *Drosera* by detaching the plant from its tuber just as it reaches the surface of the soil. By this time, the tuber still has some reserves left in it, and in many cases a new plant will grow from the tuber.

Occasionally a single tuber will produce two joined plants. One can be cut off and planted separately. Early experiments indicate a reasonably high success rate with the survival of the detached plant (about 80%). A follow up report will be needed to ascertain if both plants produce a tuber, thereby doubling the number of plants.

It is expected that the tubers produced may be slightly smaller than normal, but fertilizing weekly should assist with the formation of larger tubers.

Gordon Snelling (300 Carter; Glendora CA 91740)

In the recent 1990 issues of CPN, a list of new pygmy species of *Drosera* were published. It came to my attention that a change must be made due to an inaccuracy

in my original information. The species which was called *D. manniana* is now officially described as *Drosera manii* Cheek. I'm glad to see that Phill Mann is recognized for his discovery. I'm sorry for any confusion this may have caused.

Ernest Taniguchi (45-1040D Waialele Rd.; Kanoeha HI 96744-3153 USA) writes:

I've been trying to read as much literature I can find on the genus *Biovularia* and *Polypompholyx*. After the 1942 publication of Lloyd's *Carnivorous Plants*, *Biovularia* seems to have disappeared in literature. My guess that it has been lumped into *Utricularia*. (True, ed.) I would like to know some background on what has occurred over the years. Maybe some knowledgeable readers could send in an article and make a few references on literature.

Also, I would like to see color pictures of the genus *Genlisea* published in CPN. I hope someone may have photos they can send to ICPS for future issues.

Ed. note: The March and June, 1991 issues were combined in a special issue devoted to Peter Taylor and his work on *Utricularia*.

First Verified Reported Case Of *Sporotrichosis* In An ICPS Member

By Don Schnell

Several years ago, we reported in an issue of CPN a warning from governmental agricultural authorities that dried, baled long fiber sphagnum moss was a carrier of the fungus that causes *Sporotrichosis*. Since then, the warning has appeared in several gardening magazines, and this has been picked up by ICPS members who have sent in several short items on it for CPN.

Sporotrichosis is caused by a locally invasive fungus that is capable of living in soils, and by extrapolation, soil-like substances such as sphagnum moss. Assuming the individual does not have some sort of immunity problem (in which case it could enter the body through the lungs by inhaling dusts), the usual mode of entry is through a small wound in the hands when the victim has been working soils. The first lesion is a raised, red papule which eventually ulcerates. If untreated, the fungus spreads up the superficial lymphatic vessels of the arm, causing more papules and ulcers along the way. In the elbow and armpit tissues are many structures along the course of these lymphatic vessels called lymph nodes ("lymph glands" by some), and when the organism reaches these, they swell and may abscess and drain. The disease has the worst prognosis if the armpit nodes get involved since from here it may enter the chest.

The initial treatment of choice is a special iodine solution given orally several drops per several doses daily with water. **(WARNING!—This solution should only be given out by a physician's prescription.** Do not attempt self treatment after self diagnosis with the commonly available tincture of iodine which is quite poisonous if taken by mouth!). Unfortunately, the solution causes variable digestive irritation and must be taken over a several months period.

The disease is not at all that common considering the number of people mulling around in gardens and soils. I saw my first and only case as a diagnosing pathologist in a rose bush grower in 1968. Having a propensity for remembering weird diseases, I had no trouble including it in the differential diagnosis and making the correct diagnosis after some simple tests. The patient responded nicely to treatment.

Now, we have at hand, a volunteered letter from Clyde Bramblett of Miami, Florida (he gave us permission to use his name) who seems to be the first ICPS member

to acquire this disease, at least as far as we know. The story is particularly interesting since CPN played so vital a role in catching it in time. Clyde's story is as follows:

"... I have been using sphagnum moss for potting material for thirty years (or more) and never gave it much thought as to being any problem— Let me now add my voice to the concern about the danger of infection from this medium. Sometime in the latter part of December (ed. note— His letter dated 1 Feb 91) I noticed I might be getting some type of infection from a fire ant bite on top of my wrist. Big deal— No problem—Right? I treated it with hydrogen peroxide, rubbing alcohol and iodine(locally). It grew and became an open sore. When it became obvious that things were not getting any better, I finally went to a doctor. He prescribed some medication that cost \$91.00 to fill— it didn't help. The infection was growing fast now and had reached above my elbow. Then I remembered an article in CPN about a sphagnum moss problem. I went fumbling through old issues without success so I called my old friend Bruce Bednar who managed to find it in volume 13 dated March, 1984. There it was: *Sporotrichosis*. I took the newsletter to the doctor who, after reading it, agreed. I had seen three doctors, been in the hospital out-patient clinic, had lab cultures made, and spent quite a bit of money, and there it was in CPN all the time. I am now taking 40 drops of potassium iodide three times a day and have open sores from my hand to above my elbow and am hoping to see some good results soon."

In a follow up note a few weeks later, Clyde mentioned that all tolled, he had 12-15 open sores and that the iodide treatment was working since they were drying up.

Plant Versus Animus

By John D. Williams

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How would you like to be involved in a real-life man-eating plant story? Picture the one in the deepest jungle, where the explorer unexpectedly comes upon a huge, odd, malevolent plant. Getting too close, he finds the plant in sudden writhing motion, capturing and nearly consuming him. Sensational and sensationalized, yes?

Our culture has been treated to stories like these for hundreds of years. Furthermore, these tales are kin to older moving-plant stories that go back through much of recorded history, like this excerpt from the Book of Taliesin:

The oak marching swiftly made heaven and earth quake
He was a stout guardian against the enemy,
his name is much revered.
The blue bells fought
and caused great pain;
they crushed and were crushed, others were pierced through.

In fact there is some evidence that the Druids, priests of the Celts (from which Taliesin took his influence), practiced a sort of tree worship which involved members of the plant kingdom moving with self-contained power. They practiced dowsing. They held ceremony in deepest forests. The few accounts that exist of them hint at an animism for trees (the Roman poet Lucan, for instance).

Truth is stranger than fiction. And for legends to survive for hundreds of years, often elements of truth involved. One explanation for man-eating plant stories is

found in exaggeration. If a species exists that can drown a small mammal (and the pitcher plants can do this), it follows that someone will describe a plant ten times the size. This trend also occurs with the more bizarre animals—the Kraken or giant squid, snakes, whales, sharks, etc. But it is true that in instances of “fabulous beasts” the sightings are fleeting; the glimpses afforded were slight; the enigma grew from that. It is hard to measure a whale at sea even today. One of course expects that with plants, size estimates would be much easier. Integrity comes into question. It is unlikely that any explorer coming back from little-known regions would be considered for return if fantastic creatures were not described. Yet, this was in most cases true anyway... naturalist accounts from the 18th and 19th century are wealths of botanical and zoological information. Fabricated stories weren’t needed to justify subsequent trips.

According to Edwin A. Menniger in Fantastic Trees at least some of the man-eating plant reports were initiated by local natives to protect their resources. One tree in particular—the “upas”—was cast in a particularly grisly light: one which has formed the basis for many of the more famous stories. But this explanation too seems incomplete. In the era of expansionism, when the Europeans were eager to exploit and to ferret out the secrets of the globe, it is entirely too cut-and-dry to believe that such a ploy could be successful without a willingness to believe. It is this willingness, rather than a skepticism, that merits further examination. If the three aforementioned reasons were combined, stories of large carnivorous plants seem more understandable. But it is likely too that an element of fear was involved. These adventurers were fundamentally different from those today. They were not worldly. We underestimate what mass media has done for our mentality—Back then, there were many areas of Earth that were unknown, whereas today that is simply not true—unexplored, maybe, but not unknown. And this difference can bring about basic emotional responses.

To understand what is about to be put forth as hypothesis, one should first keep in mind this digression: There is a mass of research and logic connecting human behavior with that of the rest of the animal kingdom. We are animals too, with a known lineage to apelike beings, other mammals, other vertebrates, other multicellular creatures.... Many of our behaviors are traceable to like behaviors in Animalia. One may take this on different levels either reducing humans to little more than instinctual automatons, or declaring us to be of free and wise choice in every action. Yet in either of these philosophical cases, the concept of “genetic memory” would still hold. This view states that within our minds are tendencies from our ancestors, although to some extent modified, forgotten, or subliminal. An obvious example is unconscious scratching—related to grooming behavior by many. Another is hair standing on end.

If we attempt to make more subtle connections, we are forced more to guess. Is it true that our fear of falling in dreams is related to a monkey’s safety while asleep in a tree? Could it be that in our vast monetary systems we have merely abstracted a food and territory-gathering system? In these manners, we postulate the beginnings of our reality. It is important to realize that this study is only beginning. The postulates so far are colored by anthropocentrism, and the data is hard won and vague. We have not yet entered the minds of other living beings. Ancestral tribes may have been closer to this than we with all our technical knowledge are now. At the most, we might with logic make a statement such as this: It is better to presume we share more “primitive” traits with other animals than to say that those animals share more “advanced” traits (such as consciousness) with us. It seems safer to say that we share phototaxis with worms than to say they share the ability to think with humans.

It is possible that we, at times, share the “primitive” ability to sense plants in motion. There is evidence in, among other things, animal physiology that suggests this. Many species possess much greater muscle efficiency than we; quite simply, this can be translated to an entirely different homeostasis. For example, a lightning-fast cheetah, at full stride and full power, may feel that the long grasses of the savannah

are moving past it at sixty miles per hour. We can gather no further data for this—we have simply grafted our idea of “animus” to the cheetah. We say that it moves because we believe that we move. This concept of animals in motion is so ancient and ingrained that it appears intact at the beginning of written history—except for a few hints here and there. Our oldest writings have our modern action verbs intact—“to go,” “to walk,” “to journey,” etc. But there is no logic in tracing this lineage back through the animals. There are a myriad of creatures to utilize to develop a hypothesis of what could be termed ‘opposite motion.’ And the importance of this? While we have in the past taken our baseline reality from physics, there are many reasons why biology should be considered just as rigorous and “hard” a science. Understanding how other creatures sense their world can lead to a greater knowledge. Physics may not hold interspecifically. Therefore, one could make the point that our belief in man-eating plants is a relic, instinctive genetic memory- that other species see plants try to grab them and ground flow underfoot.

Culturing *Drosera Petiolaris* Aff. “Kununurra”

By Gordon C. Snelling

300 Carter

Glendora CA 91740

In the spring of 1990 I was fortunate enough to receive several plants of a new species of the *Drosera petiolaris* complex. These plants are currently known as *Drosera petiolaris* aff. “Kununurra.”

This species, unlike the typical *D. petiolaris*, forms a large prostrate rosette. In my opinion this is one of the most attractive members of the complex. In the best plants, the brilliant scarlet lamina are in vivid contrast to the almost white petioles and central portion of the plant. The central portion of the plant itself is green but appears white due to an extremely thick coating of hairs. This is certainly the most wooly of the wooly sundews.

The value of these hairs becomes readily apparent when we look at the plant's habitat, which is typically a hot wet season a hot wet season alternating with a hotter dry season. As the soil dries during the dry season the plant dies back until all that is left is the “fur coated” central bud of the plant. At this time the hairs are likely to serve three functions: they act as insulation from the heat, they reflect light and heat away from the plant, and they act as a surface for water to condense on at night.

The culture of this species is still somewhat in the experimental stage, but I have had very good results with the following method.

Since the plant may become rather large, I suggest a minimum pot size of four inches, six might be better. I use a mix of approximately 50% peat to 50% sand. I've tried other mixes, and even live sphagnum, but I've had best results with the peat/sand mix.

I grow my plants outdoors most of the year. Last summer my plants survived several days when the temperature hit 120°F. This last winter I had several days when the low temperature was in the low 20 degree F. range. Although they survived it, there was a little damage, so I suggest growing indoors under lights during the winter.

I water my plants from the bottom in trays. Each day enough water is put into the tray so that it will be completely absorbed by evening. During cooler weather I reduce watering accordingly. This plant will sometimes go dormant during the summer. If this should happen water should be reduced to keep the soil just damp and watering resumed when growth resumes.

Propagating this plant has proven to be fairly easy and can be done using several methods. Seed, when available, germinates readily although growth is somewhat slow.

Mature plants will often produce plantlets from the side of the crown. When this occurs, these plantlets can be removed and potted up. In addition, the entire crown may divide down the middle producing two mature plants.

However the easiest-yes, there is an easy way to propagate this plant is by leaf cuttings. So far, in my experience, this species has not exhibited the same reluctance to strike from leaf cuttings that other *D. petiolaris* forms show.

When I first received the plants, I automatically took cuttings as a precaution against the loss of the plant. These leaves were buried about half way in long fiber sphagnum moss. Being familiar with the strike problems of other members of this group, I was quite amazed to see plantlets poking through the moss in three weeks. Overall I had about an 80% success rate.

After examining failed leaves from this and other attempts, I have determined that when taking cuttings it is vital to "cut" the petiole as close to the plant as possible. Leaves that are cut off too far above the leaf stem junction invariably fail. The best way I have found to take the cuttings is to grasp the leaf as close to the plant as possible and pull gently downward until the leaf comes free.

In subsequent cutting attempts I have found that unless the leaf is obviously dying, age has little effect on success. In addition, temperature seems to play only a small role as well. I have had pots of cuttings strike with equal success indoors under lights and outside subjected to variable day-night temperatures.

In anticipation of questions regarding the availability of this plant for trade, at the moment I have no spares available, although I anticipate having some soon so feel free to inquire. Although I have had great success with cuttings I have found that the resulting plantlets are often quite sensitive to disturbance and should be allowed to become well established before repotting.

Pinguicula villosa The Northern Butterwort

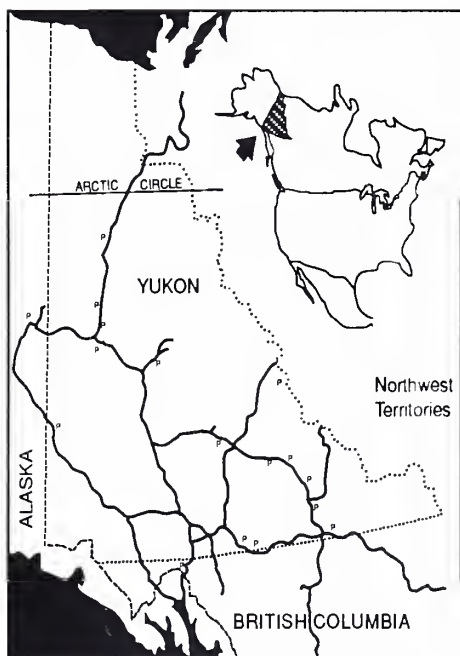
Article and photos by:

Randy Lamb

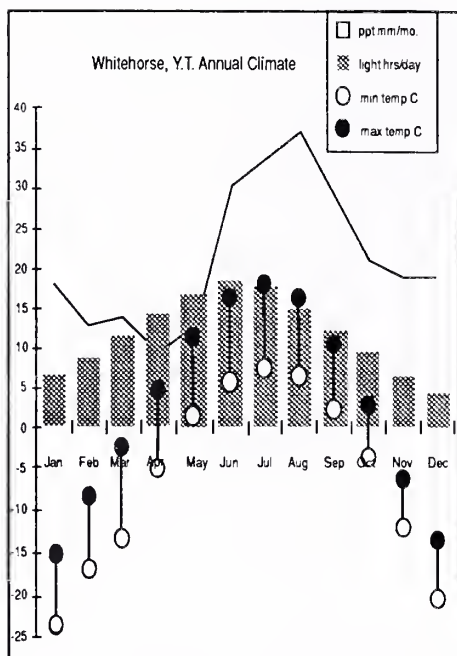
(4304 E. Pender St, Burnaby,
British Columbia, Canada, V5C 2M6)

Introduction

Pinguicula villosa, the minute butterwort of northern Canada and Alaska, has been commented on sparsely to date and studied by few. Rarely cultivated and even more difficult to obtain, this butterwort prefers to grow in the remote and often inaccessible north which helps contribute to its status as a "rare" plant. Despite being labelled as a very difficult plant to grow, if careful attention is given to the stringent culture requirements of *P. villosa* then successful and flowering colonies can be grown. Ranging from northern British Columbia [59 degrees latitude], to within 160 kilometers [100 miles] of the Arctic circle, 16 study sites were visited and observed over a four year period. The accompanying map shows the study areas which consisted mainly of Canada's Yukon Territory and included parts of northern British Columbia and eastern Alaska.



Alaska, BC, Yukon and study sites.



Yukon's annual climatic data.

Morphology and description

The basal rosettes of *P. villosa* resemble tiny gaping green mouths due to their highly inrolled leaf edges. The plants, each with two or three leaves which last the entire season, are found set into the tops or sides of Sphagnum hummocks.

The butterworts size and color varied with the amount of sunlight received during the season. Rosette diameters ranged from 1.0 centimeter in full sun to 2.5 cm in heavy shade. Leaf coloration ranged from a very light green in shaded sites, to becoming lightly suffused with copper color when found growing in full sun. (See photo on page 78 (top).

The flowers of *P. villosa* are a medium purple in color with a white rimmed yellow-orange palate that is striped with thin black lines. The flower stalks are unique as they are covered with fine hairs giving them a furry appearance. Flower and stalk size were also found to vary with light exposure. In full sun the flower stalks averaged 3 cm in height with tiny 0.5 cm flowers, while in heavy shade *P. villosa* grew flower stalks up to 6 cm tall with larger 1.0 cm long flowers.

Seed production in *P. villosa* was always minimal in the wild and appeared to be partially weather dependent. Unless optimal conditions occurred during the short growing season, only a fraction of the butterworts observed would produce flowers. Seed capsules were not always produced and frequently bare topped stalks were seen in the colonies studied. When seed capsules were produced, seed production was found to be sparse. In no instances were insect pollinators seen.

The seed capsules of *P. villosa* differ from the regular pointed-top tear-drop shape as seen with *P. vulgaris* and *P. macroceras*. In addition to the basic tear-drop shape there are two wings emerging, one on each half of the seedpod. The short wings project upward to meet and form a flat horizontal ridge at the seed capsule's top giving it a stubby upside down missile-like appearance.

The short growing "window" for *P. villosa*, as shown on the graph of annual climatic conditions, results from the long harsh northern winters which leave approxi-



Basal rosettes in Sphagnum moss with *D. rotundifolia*.



Rosettes with penny for size comparison

mately only a four month growing season. In its natural habitat, *P. villosa* does not put up its few leaves until late May, followed by flowers in late June. Dormancy and the accompanying hibernaculum formation is achieved by early August. The reason for the early dormancy is that even in the southern Yukon, frost frequently appears by the middle of August.

Locating the plants

First encounters with this inconspicuous insect-eating plant often end up with many being trodden upon before the plants are spotted. Usually it is the showy yet equally small flower, not the basal rosette of leaves, that first catches the eye of the individual when out in the field. However, once the appearance of butterwort's habitat is recognized and its biology is understood, they can be located from a distance. By watching for the plants habitat instead of the plant itself, searches for *P. villosa* will have a higher degree of success.

In addition to the small compact species of Sphagnum moss that the butterworts grow in, other plant associates include *Picea mariana* (Black Spruce), *Vaccinium oxycoccus* (bog cranberry), *Rubus chamaemorus* (cloud berry), *Drosera anglica*, *D. rotundifolia*, as well as *Platanthera* and *Cypripedium* orchids.

Home cultivation

The only method for success when cultivating *P. villosa* is to mimic the natural conditions under which they naturally grow, in particular their substrate and growth/dormancy requirements. With proper cultivation technique the butterworts will produce higher numbers of flowers in culture than in the wild where they are often stressed.

Cultivation mediums best suited for *P. villosa* are the smaller and more slower growing forms of Sphagnum, which will not overgrow and smother the tiny butterworts. By using live Sphagnum moss, a continually moist and acidic environment is always ensured.

Dormancy requirements and seasonal cycles of plants from increasingly northern latitudes, such as for *P. villosa*, are difficult to alter. Strong responses to changes in photoperiod, light intensity and temperature automatically trigger the plant's biological clocks to begin dormancy processes and cease growth. Once dormant, the butterworts can be kept in the fridge until spring arrives to stimulate their natural winter conditions. Freezing of the plants is not required or even recommended as it may prove fatal to them. It is advisable to check the stored plants periodically to give them an air change and to check for fungus or mold attacks which may require treatment. As is indicated by the climate graph, the butterworts should be brought out of the fridge in early May to imitate their natural seasonal cycle and begin growth once again.

Water levels should always be at least 10 cm [4 inches] or more below the moss surface. In nature, the butterworts are usually located further up from the water table and rely on the Sphagnum's wicking effect to keep them moist on the hummocks sides and top. Watering from the bottom by the tray method is recommended.

Lighting requirements can range from partial shade to full sun. When *P. villosa* is cultivated at more southern latitudes, growth begins much sooner due to the earlier occurring spring conditions and increasing daylength. In southern British Columbia and northern Washington state, cultivated plants which were not stored in the fridge overwinter will usually be in full bloom by late April. These same plants will have reverted to dormancy however by the end of June due to their short growth season so it is best to keep them stored in the fridge, as stated previously, and start them later in the spring as they would have naturally. So far, plants in cultivation have shown no problems coping with the shorter daylength during the not-as-long summer days at lower latitudes.

Any attempts for off-season growing of *P. villosa* will require artificial growlights to break dormancy and to simulate their required natural photoperiods. Success may be achieved but it is important to remember that chances of plant loss are greatly increased with such attempts.

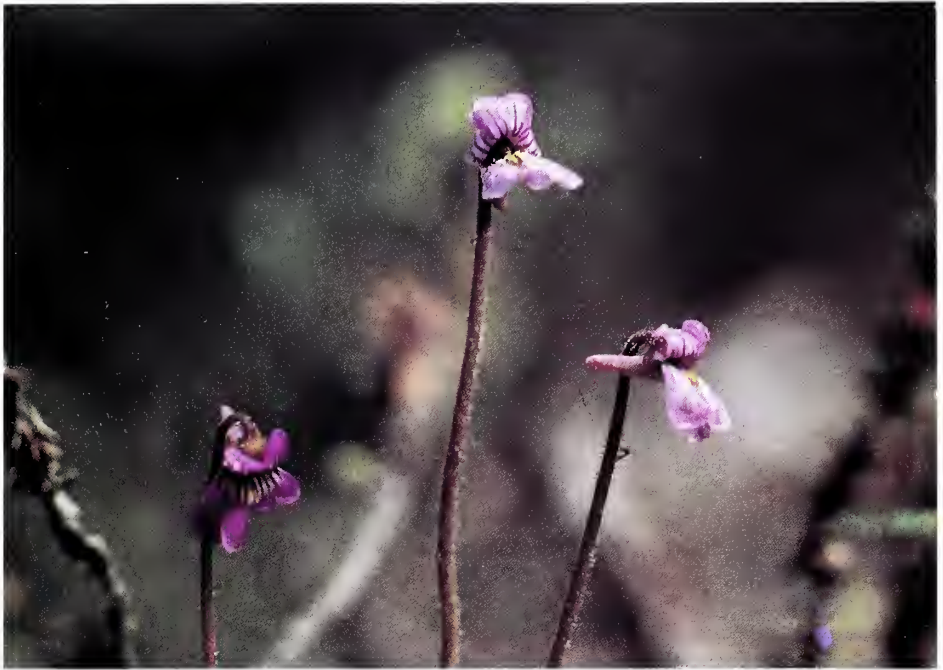
Temperature requirements of the butterworts are not stringent during the summer months, but avoid excessively high heat for prolonged periods. Once the plants have begun dormancy, they should be placed in a cooler, shaded area for a few weeks and then stored in the nonfreezing portion of the refrigerator until the following spring.

Feeding requirements are minimal with *P. villosa* and should only be done naturally by placing fruitflies or equally small insects on the leaves. Sometimes very small amounts of skim milk powder can also be used successfully as food.

As with most insect-eating plants the overall performance, seed and gemmae production will be enhanced by the season's end with such supplementary feeding. Each time the dormant plants are brought out of refrigeration for their next growing season, the gemmae should be separated and planted to help establish a larger colony of plants.

Summary

Surprisingly, *P. villosa* appears more frequently than expected in the boreal Black Spruce-Sphagnum habitat which predominates in much of northern North America. Although more tedious and time consuming to grow than your easier types of carnivorous plants, such as the Cape sundew, colonies of *P. villosa* will reward you with a mini landscape studded with many flowers in the spring. Pinguicula fanciers should find this tiny butterwort's contrast in size with their regular species intriguing. The size of *P. villosa* should also appeal to those who grow other miniature carnivorous plants such as the pygmy sundews. If you are fortunate enough to be able to locate a source to obtain these tiny butterworts from, you will find growing them challenging but well worth the trouble.



P. villosa at Angela Lake—close up of flowers.



Group of pings in bloom along open ground.

Pinguicula vulgaris along the early Alaska pipeline

Article and photos by: Randy Lamb

(4304 E. Pender St, Burnaby, British Columbia, Canada, V5C 2M6)

Those who have been fortunate enough to travel along the Alaska highway know that both Alaska and Canada's Yukon Territory hold adventures and surprises around every corner. Over the past few summers I had the opportunity to explore and botanize many of these remarkable areas while working in the north as a Biologist.

Located off the Alaska highway at kilometer 1743, behind the community of Destruction Bay, Yukon, are several marvels I found side by side. There, hidden amongst the Spruce trees along the base of the Kluane mountains are the famous Alaska highway, the historical US Military pipeline and colonies of insectivorous *Pinguicula vulgaris*. During the 1942 war effort to connect Alaska to the rest of the country by road, the 2340 km [1520 mile] long Alaska highway was built in under nine months to become heralded as one of the world's great engineering accomplishments. Later in the 1950's the early "Alaska pipeline" was built along side the highway to transport different petroleum products from Haines on the coast, through the Yukon Territory, to Fairbanks, Alaska inland. This same 8" pipeline can still be seen today from many sections of the Alaska highway.

Unintentionally, when the Army built the pipeline they also built an ideal habitat for *P. vulgaris*. The exposed ground on each side of the pipeline, known as the "right-of-way", was kept clear of trees and brush during the pipeline's use until the 1970's. These open areas let in sunlight to the ground below which is kept continually moist by the snow-melt seeping down from the mountains immediately above. As the water percolates down through the Spruce forests and scree, small amounts of nutrients and minerals are picked up to be later deposited on the exposed ground. The butterworts soon colonized the newly created habitat and multiplied. Sometimes the butterworts can even be found growing out from under the pipeline as shown in the photograph. Despite the frequent and strong winds, such as those which destroyed an Army camp



in the early years to give Destruction Bay its name, the butterworts are sheltered by the trees growing along both sides of the pipeline's right-of-way.

Today, *P. vulgaris* can be found growing densely beside sections of the pipeline along with *Cypripedium* and *Coralrhiza* species of orchids. The time of year to catch the butterworts and orchids in bloom is usually mid to late June. Along the pipeline, which has been unused for many years now, regrowth should continue to thrive in these areas for many more years to come to be enjoyed by both the appreciative and the curious.

Butterwort growing out from under the pipeline.

Carnivorous Plants Of Caraça, South America

By Fernando Rivadavia

(Rua Inacio Pedroso 230, C.E.P. 05612, São Paulo, SP; BRAZIL)

In 1708, explorers seeking gold and precious stones in the inhospitable highlands and forests of Minas Gerais (present-day Brazil) came across a mountain with the contour of a human face which they called "Caraça", (pronounced "Kahrahssah") or "Big Face" in Portuguese. In 1820, 11,200 hectares of land, named after the face-shaped mountain, were donated to the Lazarists priests, together with a sanctuary which had been built in the region in 1774 by a hermit priest. Today, the sanctuary works as a small, very simple hotel run by a couple of priests.

My high school has been organizing trips to Caraça for the senior class for many years now, and from the 14th to the 19th of May, 1990, it was my turn to go. It took us about 10 hours to go by bus from São Paulo to Caraça, and we arrived on Monday night. We walked between 10 and 15 kilometers each day, visiting waterfalls, climbing mountains, and even walking inside a small mountain river for 3 kilometers, against the current, with freezing water up to our chests in some areas! We left on Saturday morning.

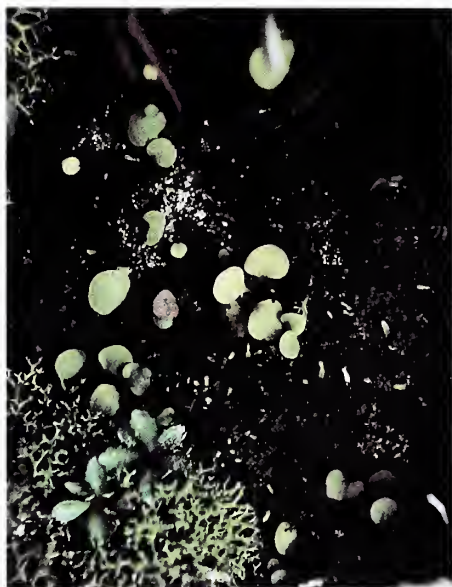
In late July, a friend of mine called Maurício, who also collects CPs, went to Caraça too. In total, we were able to find 11 species of CPs: *Drosera graminifolia*, *D. montana* "pink flower", one species of *Genlisea*, *Utricularia subulata*, and 7 other species of *Utricularia* which we have not been able to identify for sure yet. Maurício is going back to Caraça in November when they will be flowering and should help us identify these species.

Caraça is a paradise for botanists. Varying in height from 750 to 2100 meters, Caraça is located in a transition area between tropical rain forests typical of the coastal areas of Brazil and the savanna vegetation typical of central Brazil. Thus, the area permits a large diversity of fauna and flora to emerge in a relatively small area. In fact, Auguste Saint-Hilaire in 1816 and Von Martius in 1818 came to Caraça to collect specimens of local flora and fauna during their travels around Brazil and South America.

So here are some descriptions of the habitats where we found each species:

Drosera graminifolia—was found in one location, at around 1900 meters near the summit of a mountain, where water from natural springs ran down over rock walls and sphagnum moss formed spreading carpets. Large specimens of *D. graminifolia* were observed here, growing rather scattered, with leaves up to 25cm in length. The pH of the water was 6.5 while the sphagnum had a pH of 4.5. A few meters farther up, there was a terrace-like formation in the mountain. Large quantities of this species grew here, forming a mat of dead leaves between 5 and 10 cm high on top of sandy soil. These plants were growing closer together than the ones growing on sphagnum and they had flowered between 3 and 4 months before I observed them in May. The flower stalks were rather strong and woody, up to 35cm tall. Most seeds had already been shed by the time I saw the plants in bloom, but Maurício has seen this species flowering at a site in Diamantina which is about 200km north of Caraça. He said the flowers are light-pink colored and very large. On top of this mountain where we found *D. graminifolia*, the summer temperatures range between 20 and 40 degrees Celsius and the winter temperatures range between 0 and 18 degrees C, in the sunlight.

Drosera montana "pink flower"—is very common in the area. We found 7 different locations varying in altitude between 1250 and 1400 meters, always growing on stream banks, in sand and clay mixtures with varying proportions of each. In some places, there was ash mixed with the sand and clay; a result of brushfires which are



There are three *Utricularia* species here. *U. pubescens* can be seen in the bottom center. The leaves are round. The *U. tricolor* leaves can be seen in the center of the slide. The last species is *U. subulata* with thin leaves seen mainly in the top center.



Leaves of *U. nephrophylla* with the smallest leaves, growing in this location.



Leaves of *U. nephrophylla* up to 4cm in diameter and 12cm high. The plants grow near *D. graminifolia* on spagnum moss around 1900m.



Closeup leaves of *D. graminifolia*. This plant was growing on sandy soil on a terrace-like formation.

very common and normal in the region. *D. montana* has bright red leaves when fully exposed to the sun and may form thick rosettes up to 4 centimeters across. In most locations the plants were producing flower stalks, but had not opened the first flowers. This species was always found growing together with one or more species of *Utricularia*. For *D. montana*, *Genlisea*, and the other utricularias, the following conditions were found: the pH varied between 5 and 6.5, while the temperatures may vary between 20-45 degrees Celsius in the summer and between 5 and 20 degrees C in the winter under full sunlight, unless stated otherwise like when *D. graminifolia* is growing between 1900 and 1955m. The elevations are nearly the same varying between 1250 and 1400m.

***Genlisea* sp.** (probably *G. violacea*)—Maurício located a single, small plant which was growing along with *U. subulata* and mosses on top of pure sand next to a small pool formed by a stream.

Utricularia subulata—can be found on almost every stream bank at Caraça, growing on any moist soil mixture or together with mosses on bare rocks. Wherever *D. montana* was found, *U. subulata* was always present. We found the cleistogamous form of *U. subulata* growing in one location on almost pure sand, along with *D. montana*, next to a stream.

***Utricularia* sp.** (aquatic)—I found submerged in water, clinging to rocks in 2 mountain streams where small pools formed or where the highly oxygenated water didn't flow too fast. The yellow flowers were scattered along the flower stalk, each a few millimeters above the other. The length of the peduncle always depended on the water level rising above it up to 15cm in total. Growing from the base of the flower stalks were feathery leaves which flowed with the current. Runners fastened the plants to the rocks, spreading in web-like formations with peduncles rising here and there.

***Utricularia* sp.** (probably *U. nephrophylla*)—We came across 3 locations. The length of the kidney-shaped leaves varied much between these three places, so we are not sure if they are the same species. At one site, it was found growing in partial shade near *D. graminifolia* at 1900m, on sphagnum moss at pH 4.5. Here the petioles were up to 12 cm high and the leaf blades up to 4 cm in diameter. At another site, it was found growing with common moss on top of rocks, at the base of a waterfall. The petioles were around 6cm high and the blades up to 2.5cm in diameter. At the last location this species was growing on a stream bank in a sand-clay mixture. The leaves were even smaller here with petioles around 2cm long and blades up to 1.5cm in diameter.

***Utricularia* sp.** (probably *U. pubescens*)—it was only seen in one place, on a shady stream bank along with common moss on top of sandy soil. The round leaves were between 3 and 5mm in diameter. The temperatures were somewhat lower here due to the constant shade over the stream bank.

***Utricularia* sp.** (probably *U. tricolor*)—we found one location together with *D. montana* and *U. subulata* growing on sand-clay mix next to a stream. The leaves were around 5mm in diameter.

***Utricularia* sp.** “purple flower”—was observed at 3 sites growing in sphagnum moss between 1900m and 1955m (pH 4.5) and in sand, clay and ash mixes together with *D. montana* and *U. subulata*. Its leaves are elliptic (normally around 2mm in diameter) and the flower is somewhat similar to that of *U. tricolor* but smaller.

***Utricularia* sp.** “yellow flower” - was located growing in pure sand next to a stream. Its leaves are similar to those of *U. subulata* but it has a long, climbing flower stalk.

***Utricularia* sp.**—was growing near *D. montana* and a few *Utricularia* near a stream. The leaves are very similar to *U. subulata* but there were no flowers when Maurício found this species. It was growing in a semi-shady area, farther away from the stream than the other CPs in this location. Thus, the sandy soil in which it was growing was also somewhat drier.

Special Notice

By Don Schnell

In the March/June, 1990 issue of CPN (19:11) on page 11, we published a comparative list of proposed names for some Australian *droseras*, using a title with phrases such as “previously unnamed” (implying they were now named), and “published names” (implying publication). In fact neither is the case for this list.

The list has been bouncing from one CP bulletin or newsletter to another, and I am playing catchup with this clarification sent to each one in order that readers not be confused. I even have to do this for CPN where I am co-editor, which shows what happens when we become too busy!

As we mentioned often in past issues of CPN, there is an international organization called the International Association of Plant Taxonomists (IAPT) which largely researches taxonomic problems and proper procedures for nomenclature. They have a monthly publication called TAXON, and when revisions are necessary, they update the International Code of Botanical Nomenclature (ICBN), which is kind of a central “lawbook” for procedures for naming plants, and it is subscribed to by all serious botanists.

The ICBN lays down specific requirements for a new plant name to be “published” in the strict sense; that is, to deserve serious recognition among those studying taxonomy. The listing of these plants under supposedly legitimate names (names are illegitimate if not according to ICBN rules) in Mr. Lowrie’s otherwise two fine books does NOT constitute publication in the botanical sense and therefore they cannot be accepted and should not be seriously used at this time. To save confusion, I would suggest readers ignore the list and continue with the temporary field “names” in single quotes for the time being.

In his first two volumes, Mr. Lowrie proposes these names but does mention that they have not yet been officially published (or described) and that this would be accomplished by Dr. Neville Marchant. Given the lead time since working up the first volume, Dr. Marchant seems to have not placed this problem as a top priority and he has published none of the proposed names. However, Martin Cheek and associates of Kew Herbarium have begun some of the work and a few papers have appeared which fulfill the criteria for publication—These have been reviewed in CPN, and those few names may be used in place of older field designations.

One of the problems with suggesting, even if by accident of language, that the proposed names are published is that when true publication is undertaken the researching botanist may find taxonomic or other problems precluding the use of the proposed name, or that it is not even a new taxon or is of a different rank as a result of his proper and careful studies toward publication by ICBN rule and custom. Thus, a third layer of confusion will be added!

An illegitimate name is also known as a *nomen nudum*, literally a naked name that belongs nowhere for the time being. I would suggest readers be patient and watch for individual true publication of each proposed taxon rather than use an illegitimate name.

Want Ad

David C. Crump (803 Glasgow Rd.; Charlotte NC 28214 USA. Phone: 704/399-3045.

ST: *D. capensis*, *D. filiformis filiformis*, *D. filiformis tracyi*, *D. binata*, *D. intermedia* (Carolina plant) and seed, *D. burmanni*, *Sarracenia flava* (red veins, SC) and *Dionaea*.

T: *Nepenthes*, *D. schizandra*, *Heliophora* spp., *Darlingtonia*, *S. rubra* ssp. *jonesii*.

Literature Review

Adam, J. H. and C. C. Wilcock. A new *Nepenthes* from Gunong Besar, Kalimantan Selata, Borneo (Indonesia). Gard Bull. (Singapore) 42 (1/2):25-28. 1989.

The new species, *Nepenthes borneensis*, from the above area is described in this paper.

Anonymous. 1991. Rescue mission saves rare carnivorous plants from extinction in Georgia. Clippings (Atlanta Botanical Garden Newsletter)14:2.

This little newsbit summarized in the ABC's bimonthly news publication is a welcome sight since it is the first aggressive program in the United States to reclaim a CP site through the activities of multiple organizations. It is particularly refreshing in light of the US Government's failure to establish a viable, ongoing realistic reclamation plan for *Sarracenia oreophila*, for example, in spite of a meeting of "experts" (there were many present) about fifteen years ago in North Carolina. The only thing we see or hear is continued moaning about failing sites which have many counting stakes, while everyone stands around scratching or something. By taking charge, many *S. oreophila* locations can be reclaimed.

Considering the above, we are presenting a slightly longer review than usual. *S. purpurea* ssp. *venosa* has a break in its range through most of Georgia, as one can see by examining any of several range maps. As noted in the article, the old coastal plain locations are no longer extant (although with further searches and working through local peoples, more might be found). Hence, the concept "rare" for the state even though nationwide the ssp. is not yet rare. However, a couple of unusual montane locations are still viable in Georgia.

A joint effort of the Atlanta Botanical Garden (led by Ron Determann), the Department of Natural Resources, the US Forest Service and the Chattahoochee Nature Center, resulted in a large party descending on one of the montane locations. They counted 24 plants in heavy overgrowth (this is the point where most *oreophila* efforts stall), and opened 900 square feet of area to sunlight with saws and machetes.

Ten small rhizome divisions from ten different plants were taken by Ron to the Botanical Garden where a two-pronged effort is really being accomplished to multiply them. The divisions will be grown to maturity, flower, set seed, and seedlings and divisions replanted in the reclaimed area in winter, when the water table is higher). More division of the plants still in situ will be made and set out in the reclaimed and recleared area along with the seedlings of the same gene pool acclimated to that area.

The divisions moved to the Garden are already vigorously producing new, deeply colored pitchers, contrasted with the pale, etiolated leaves in the overgrown area. Faster and better growth and propagation will speed and optimize the process.

Good luck to this group's sound efforts! (DES)

Bender, Steve. 1990. Beauty in the bog. Southern Living Magazine 25: 42-44.

This popular article in a southern magazine describes how some people discovered a savanna bog on their property near Fairhope, Alabama. They had moved there with the intent to raise cattle. After clearing and burning off a wooded area one autumn with the intent of extending their pasture, the following spring they observed a heavy growth of beautiful bog plants, including *Sarracenia leucophylla*. They decided to preserve the area and have been burning it off every year since. They have now built a boardwalk for visitors to observe the very fine mix of plants. Three color photos show a very nice display over several acres. To visit the site if you are in southern Baldwin County, Alabama between April and September, call 205/947-3044 for an appointment and directions. There is a nominal admission charge of \$2.00 to help cover expenses. (DES)

Bennett, Simon T. and Martin Cheek. 1990. The cytology and morphology of *Drosera slackii* and its relatives in South Africa. Kew Bull. 45:375-381.

Drosera slackii (named in honor of the late Adrian Slack) was briefly described by Cheek in 1987. This paper presents a comparative morphologic description of it and closely related species along with updated chromosome counts. The closest relatives are *D. cuneifolia* and *D. aliciae*. In 1970, *D. aliciae* was listed as $2n=80$. However, the present study shows a sample with a chromosome number of $2n=40$, as does *D. slackii*, and two newly named (1988, Debbert) droseras in the same geographical area, *D. admirabilis* and *D. venusta* ($2n=40$ reported by Debbert in literature and not repeated here).

The paper also includes a geographic map showing rough locations, and a full page drawing of *D. slackii* intact and in parts, along with various structures of the other closely related species for comparison. *D. slackii* is described of commercial value in that it is a very attractive rosetted Cape sundew that is easy to grow, and this reviewer is certainly in agreement.

Earley, Lawrence S. 1991. Stew in Brunswick. Wildlife in North Carolina 55:14-21.

This article discusses the downturn in plant and animal species in Brunswick County, North Carolina as development and population growth take an upturn. For those not familiar with this county, it is the location of the legendary Green Swamp and has been called the most ecologically diverse county in North Carolina, and having the most threatened or endangered species. In the last ten years, the population of this previously rural county has doubled, as it did the ten years before that, and as it is expected to at least do in the next ten years. The main problem is exponential growth of retirement homes and golf courses and services to serve the increasing population. There are no zoning laws to protect wild areas, although enactment of these is being contemplated. Several biologists are quoted regarding decreasing plant and animal wild areas, and most of us who have been visiting the area for 25-30 years would readily concur. The article is considered and well written. There are many color photos among which are the following CP: A very nice full cover of *Sarracenia minor*, a savanna in moderate shape showing *S. flava*, and a photo containing both *Drosera filiformis* and *Utricularia cornuta*. There is also a semi-diagrammatic map of the county showing sample ecosystem locations. (DES)

Fagerberg, W.R. and D. Allain. 1991. A quantitative study of tissue dynamics during closure in the traps of Venus's Flytrap *Dionaea muscipula* Ellis. Am. J. Bot. 78:647-657.

This is a very good paper discussing research work done by the authors in extending what work had already been done on leaf movement in *Dionaea*. The paper opens with a brief but complete review of work done since Darwin to this day. They summarize closure into three phases, the first and third having been recognized before, but the second a new distinct category: Capture—The familiar quick phase which has been studied most; Appression—An approximately 30 minute phase that is slower and results in trap margin contact; and Sealing—Completed in about 1 hour post-stimulation and characterized by tighter sealing of the trap margins just internal to the edges with the actual edges somewhat everted.

The authors very cleverly divide the trap into three zones (A, B and C) and excise these from several plants during the above mentioned phases. Excision was quick and smooth and fixation immediate so as to arrest any anatomic changes for study by light and electron microscopy. The article should be read for details and completeness, but in summary they found a very complex inter-related sequence of cellular enlargement changes in each of the three regions that collated with what would be expected physically to result in the gross observable three closure phases.

The authors conclude with some paragraphs of theoretical discussion on physiological control of this process which may be related to pH and calcium transport across cell membranes as extrapolated from Japanese research on these ions and their effects on *Aldrovanda*, and the fact that traps can be successfully anesthetized by pH buffer variations and use of calcium channel blocker compounds. (DES)

Folkerts, G.W. 1990. The white-topped pitcher plant— A case of precarious abundance. *Oryx* 24:201-207.

This is a well written and conceived popular conservation article with four photos (including one ironic one of buckets of clipped *S. leucophylla* pitchers awaiting packing) and some references.

After a brief introduction on the nature of pitcher plants and their habitats, the article focuses to the Gulf coast where, at the moment, there is still a greater abundance of pitcher plant habitat compared to disastrously rapid destruction of sites on the Atlantic coastal plain. Here, the author also sees the beginning of a precipitous decline.

He describes the main roles of decreasing fire at appropriate times of the year (most natural fires are spring and summer and some research indicates better response than with the traditionally accepted winter fires), land use changes with drainage and destruction of habitat, horticultural collecting (personal and commercial) of taxa or variants whose numbers have become critical, and lately the growing fad of using *S. leucophylla* pitchers in flower arrangements here and abroad. Because CITES has regulated international trade in sarracenias and their parts, we have a number of 500,000 pitchers of *leucophylla* per year in international trade, and an unknown number in unregulated interstate trade. The author discusses the harm of uninformed harvesting of massive numbers of pitchers from a stand at anytime, and effects on longterm plant health and productivity. (DES)

Hay, Stuart G., et. al. 1990. Additions to the flora of the Island of Newfoundland. *Rhodora* 92:277-293.

On page 286 of this paper, it is mentioned that *Utricularia purpurea* had been considered rare in the area under consideration since there was only one recorded collection. However, the authors list many more collections in Newfoundland, indicating that the species is far more widespread there than previously thought.

Hodgson, Larry. 1990. The body snatcher. *Harrowsmith* (Canadian edition) 15:66-71.

A popular article on carnivorous plants in general, but concentrating on those most adaptable to home growing and occurring in Canada. There are nice large photos, discussion of types of CP traps, growing tips, and sources of plants (in Canada, along with CITES and Canadian import information) and some books. The general descriptions and culture hints are sound.

Karlsson, P.S., K.O. Nordell, B.A. Carlsson & B.M. Svensson. The effect of soil nutrient status on prey utilization in four carnivorous plants. *Oecologia* (Heidelb) 86(1):1-7 1991.

The authors tested the hypothesis that carnivorous plants are less responsive to prey when grown in nutrient-rich soil. Four plant species, *Drosera rotundifolia*, *Pinguicula alpina*, *P. villosa* and *P. vulgaris* were tested and seven characteristics were measured. The results were that 75% of the tests showed no significant difference and therefore the hypothesis was not supported by the data. An alternate modification of this idea is that CP can grow in nutrient poor or rich soils provided that competition from other plants is low.

Krafft, C.C. and S.N. Handel. 1991. The role of carnivory in the growth and reproduction of *Drosera filiformis* and *D. rotundifolia*. Bull. Torrey Bot. Club 118:12-19.

The authors collected plants of the above two species, potted them up in nutrient poor media under screening outdoors, and fed varying numbers of fruit flies to half the plants, the other half being unfed and acting as controls. Growing the plants over a season disclosed that the fed plants in general had enhanced growth during the feeding period. The "feeds" carried over winter hibernaculum stage with increased flowering and seed production the following spring in those plants that were fed. They conclude that feeding in a nutrient poor environment has immediate as well as long lasting benefits. The discussion was interesting in trying to collate results of conflicting experiments in other papers in the bibliography, particularly with field experiments. One interesting experiment suggested that in the case of sundews growing in moderately rich fields with other competing plants, carnivory gave a competitive edge to the sundews as a source of nutrients other than the soil. (DES)

Krause, Jeannie. 1990. *Sarracenia leucophylla* in the Croatan? North Carolina Wild Flower Preservation Society Newsletter 11:4.

The Croatan National Forest is located in northeastern coastal North Carolina. The author of this note was initially pleased to see what she thought were small plants of *S. rubra* in an unrecorded area of the Forest for that species, although it had been found elsewhere. As the plants matured, however, it became evident that these were *S. leucophylla* in an area literally many states disjunct from its range and obviously disseminated into the Croatan by seed since the location was near a road frequented by *Dionaea* collectors (collecting plant or animal material without permits is illegal in a US National Forest). While the individual who sowed the seeds was undoubtedly well-intentioned, such actions in an active *sarracenia* area are to be condemned since material not native to the area can easily enter the gene pool of other species of a genus in which interspecific hybridization is so easily accomplished.

Lamb, Randy. 1990. Those sinister sundews. TLC For Plants 3:22-23.

Randy Lamb is a Canadian member from British Columbia and has written this good article for this Canadian plant magazine. It includes a surprising number of color photos in two pages, all sharp and clear, and a sound text describing sundews in general and also hints on culture, particularly at home.

Lowrie, Allen and Sherwin Carlquist. 1990. A new species of tuberous *Drosera* from Western Australia. Phytologia 69:160-162.

Drosera prostratoscaposa is herein described. It is in the section *Erythrorhiza* and is distinct by virtue of its prostrate many-flowered inflorescences. It occurs on the southern coast of Western Australia in Fitzgerald National Park. The paper includes Latin and English descriptions, type information as well as an excellent composite line drawing plate of plant parts and its habit. The plant tends to occur in dry, sandy or lateritic soils. (DES)

Nelson, E. Charles. 1991. The waxing of a glorious rajah. Kew Magazine 8:81-89.

Simpson, Rosemary. 1991. Plants in peril, 15. *Nepenthes rajah*. Kew Magazine 8:89-94.

These two articles are reviewed together since the second directly follows the first in the same magazine and both cover the same subject, *Nepenthes rajah*.

Nelson's article recounts some of the difficulties growers had with the species in the latter 19th century in the U. K. The greatest success was achieved by the Royal

Botanic Gardens, Glasnevin (Ireland) which was under the direction of Frederick Moore. Moore brought a pitcher of a plant successfully grown by him to a meeting in England and totally bedazzled the attenders. Rather than consign the pitcher to the usual crushing and drying in the herbarium, Kew commissioned a reproduction of the pitcher in wax, a popular activity by skilled artisans with flowers. The job was done by a Miss Emett, and the wax model still exists—a black and white photo is included in the article. Nelson tells a great deal of the story of the discovery, import and attempts to grow the species through letters between the principles. At one point, the famous Veitch nurseries had “hundreds” of seedlings and advised buyers to grow them as hot and as wet as possible. After losing several to those conditions, Moore tried a last specimen in the cool orchid greenhouse and was very successful.

The second article's author is with the Kew Conservation Unit. Her article overlaps in history and botanical and ecological description with the first, but in the last third or so gives a summary of conservation efforts. The species is becoming increasingly difficult to find on Kinabalu, and was one of the first species to be placed in Appendix I of CITES in 1981. Since that date, only six recorded CITES transactions have taken place, but a whole plant can still command a price of \$1000 US on the black market. (DES)

Sattler, R. and R. Rutishauser. 1990. Structural and dynamic descriptions of the development of *Utricularia foliosa* and *U. australis*, Can. J. Bot. 68:1989-2003.

In traditional taxonomy, morphologic structures are usually described in static terms for purposes of classification and identification. One might say, “A leaf is a leaf... “. However, the utricularias offer good models supporting a case for a dynamic approach, at least theoretically, since there is much discussion over what constitutes leaves, stems, roots (if any), shoots, etc., and what the traps are in traditional terms. The authors document development of shoots by means of SEM and make a proposal of how such studies and dynamic intermediate stages may in the future be useful in taxonomy.

Sieren, D.J., et. al. 1990. Noteworthy additions to the vascular flora of eastern North Carolina. J. Elisha Mit. Sci. Soc.. 106:7-9.

The only CP mentioned is a new county record for *Drosera brevifolia* in New Hanover County which is one of the counties immediately adjacent to Wilmington. (DES)

Venters, Vic. 1991. Stiffer penalties may deter poaching: Law strengthened to protect rare Venus's-flytraps. Wildlife in North Carolina 55:2 (Aug).

This is a full page informational article with a black and white photo of *Dionaea*. In spring, 1991, stiffer penalties went into effect for poaching this species. By poaching, the law determines that the term applies if the plants are collected from state lands (including roadsides and ditches to the extent claimed by the state), parks, federal lands, wildlife and nature preserves, and private lands without written permission of the owner. Owners may collect and sell from their own lands at will. Formerly, the penalty for poaching was a paltry \$10.00 per arrest—Hardly a deterrent! The new penalty is a minimum of \$100 and a maximum of \$500 for first offenders. Repeaters may be fined \$1000. This could still be little deterrent for the professional poacher collecting by the truckload, if it were not that the thief can actually be fined these amounts **per plant!**

It is estimated that over 500,000 *Dionaea* are removed from the wild each year. Most of these are sold to Holland, Germany and Japan. Besides plant removal, habitat destruction is also stressed as a very important factor in decreasing the genus in the wild.

(Editorial comment: The article mentions that this spring, someone was apprehended in the Green Swamp sanctuary with 1000 plants in possession, so the process can work. The article also states that there are probably fewer than 50 sites left with *Dionaea* in the Carolinas, and that the original 100 mile radius of range out of Wilmington has been reduced by half. I would question both these estimates, but not for the purpose of contradicting the intent of enforcement. *Dionaea*, as range examples, is still found easily in the Croatan National Forest's northern border, and on the Fort Bragg military reservation near Fayetteville, NC, where it can be found in a wet area near a cemetery as well as elsewhere. Good, or large stands are probably reduced, but I can easily find 50 locations alone in Brunswick and Columbus Counties, considering the thousands of miles of drainage ditches and margins in the coastal plain, and small locations on roadsides and in remaining low places in pine plantations. Indeed, the state itself contributes to habitat destruction by scraping berms and renewing drainage ditches uncritically. Places in many drainage ditches where the water is slower and deeper locally, support water lilies, utricularias and many CP on their margins until drainage is "facilitated".

Dionaea may be fast approaching the critical point where we are with *Sarracenia oreophila*: Originally, habitat destruction is a larger destructive force until plant populations become so small and few that even hobbyist collection of a few plants is a significant reducing process. Furthermore, I am disappointed in the timidity of NC legislators in doing more about mass collections—legal or otherwise—for shipment to the apparently insatiable gullet of Europe, particularly through the "Netherlands Connection" where we were initially fooled into believing that vast glasshouse ranges of various CP in photos from Holland were of propagated plants until keen eyes clearly disclosed that these were collected and potted up. Recall the entrepreneur written about in the Greensboro, NC newspaper a year or so ago who bragged about dumptruck-loads of CP collected legally shipped from Wilmington ports to Holland. I clearly recall about two years ago being awakened by a phone call at 4 AM and a gruff foreign voice over long distance demanding—not asking about—250,000 flytraps "right away", and did I know anyone who could do it! The caller identified his location as the Netherlands. (DES)

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